Electronic Supplementary Material (ESI) for Lab on a Chip.


# SUPPORTING INFORMATION

# Forward electrohydrodynamic ink-jet printing of optical microlenses on microfluidic devices.

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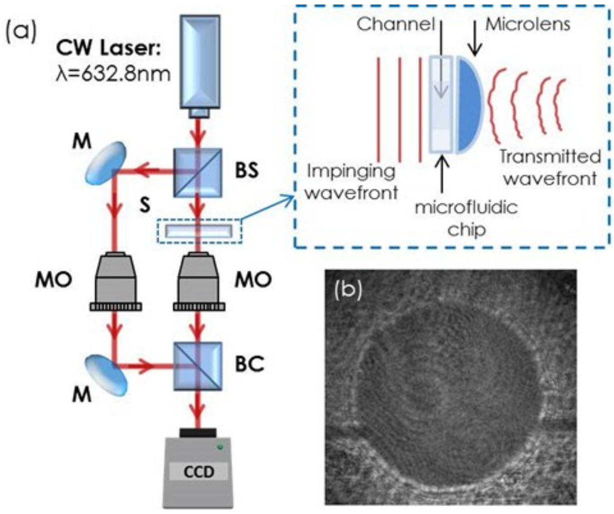


**Figure S1.** Interferometric set-up adopted to characterize the lens optical properties. (a) Mach-Zehnder interferometer. The beam emitted by a Continuous Wave (CW) laser with wavelength λ=632.8nm is first split in two parts, constituting the reference and the object arm of the interferometer. Both encounters a 5x microscope objective on their path toward the sensor (a 1024x1024 CCD camera with pixel pitch Δx=Δy=4.4μm). The object beam is directed toward the object, namely the microfluidic chip where a sample micro-lens is deposited, and then recombines to the reference in the acquisition plane in order to produce an interference pattern, i.e. the digital hologram. M: Mirror. BS: Beam Splitter. BC: Beam Combiner. MO: Microscope Objective. S: Sample plane. (b) Recorded Digital Hologram.

| Polynomial order | Name | Shape | a/λ | Abs($a_p/a_5$) [%] |
|---|---|---|---|---|
| P=1 | constant term | 1 | 28.9 | / |
| P=2 | x-tilt | $\rho\cos\theta$ | -0.38 | 2.75 |
| P=3 | y-tilt | $\rho\sin\theta$ | 1.64 | 12.0 |
| P=4 | astigmatism | $\rho^2\cos2\theta$ | 0.12 | 0.86 |
| P=5 | defocus | $2\rho^2-1$ | -13.7 | 100 |
| P=6 | astigmatism | $\rho^2\sin2\theta$ | 0.28 | 2.04 |
| P=7 | trefoil | $\rho^3\cos3\theta$ | -0.07 | 0.50 |
| P=8 | coma, x axis | $(3\rho^3-2\rho)\cos\theta$ | -0.29 | 2.15 |
| P=9 | coma, y axis | $(3\rho^3-2\rho)\sin\theta$ | -0.12 | 0.87 |

| | | | | |
|---|---|---|---|---|
| **P=10** | trefoil | $\rho^3\sin 3\theta$ | 0.03 | 0.26 |

**Table S1.** The first ten Zernike radial functions, their common names and the corresponding coefficients.